



Damnhour University
Faculty of Science
Chemistry Department
Examiner: Prof. Dr. Adel Zaki Nasr
Dr. Reda Keshk

Course No: C342
Heterocyclic and Carbohydrate Chemistry
June 2016



Section A: Carbohydrate Chemistry

Answer the following questions:

Question 1

- 1) What products are formed when D-erythrose is subjected to a Kiliani-Fisher reaction
- 2) How can you distinguish between α -D-ribofuranose and α -ribopyranose

Question 2

Draw and name the product formed when D-mannose is treated with each the following reagents:

1. Heating with nitric acid
2. Hydrogen in the presence of nickel
3. Sodium hydroxide
4. Hydroxylamine followed by acetic anhydride in the presence of sodium acetate

Question 3

Deduce the structure of disaccharide , "cellobiose", from the following data:

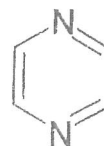
1. It forms a phenylosazone
2. It undergoes enzymatic hydrolysis with emulsion
3. Acidic hydrolysis gives absolutely D-glucose
4. Methylation with dimethyl sulfate in the presence of a base gives octa-O-methyl cellobiose which upon acidic hydrolysis gives 2,3,4,6-tetra-O-methyl-D-glucose and 1,2,3,6-tetra-O-methyl-D-glucose.

Section B (Heterocyclic chemistry)

Question (1)

(15 mark)

A- Give the IUPAC name for the following compounds:



B- write the reaction mechanism of 2 moles of ethyl acetoacetate with formaldehyde in the presence of ammonia.

Question (2)

(20 mark)

A- Comment (Give reasons):

- 1- Pyridine is more basic than pyrrole.
- 2- Thiophene more aromatic than pyrrole.
- 3- Pyridine is less reactive than benzene for the electrophilic substitution reactions.
- 4- Nitration of pyrrole afforded 2-nitropyrrole as a major product.

Good luck



23. Lymphoid lineage cells
- are the most numerous leukocyte population.
 - consist of B, T, and NK cells.
 - contain conspicuous cytoplasmic granules.
 - differentiate from myeloid cell precursors.
 - phagocytize debris and foreign cells.
24. Pathogen-associated molecular patterns (PAMPs)
- allow B and T lymphocytes to recognize bacteria and destroy them.
 - are cysteine-rich peptides that form channels in bacterial membranes.
 - are recognized by pattern recognition receptors of the innate immune system.
 - closely resemble host cell surface proteins and sugars.
 - induce secretion of interferons by virally infected host cells.
25. Which of the following are examples of molecules that are expressed on the cell surfaces of human cells that are unhealthy or abnormal?
- α and β defensins
 - C3 convertase and properdin
 - Cytokines and chemokines
 - Interferon α and interferon γ
 - MICA and MICB
26. Which of the following is a primary lymphoid organ?
- Bone marrow
 - Lymph node
 - Peyer's patch
 - Spleen
 - Tonsil
27. An 8-year-old female with a known allergy to peanuts inadvertently ingests a cereal containing traces of peanuts. Within 1 hour, she develops diffuse erythema (redness of the skin), urticaria associated with respiratory symptoms of shortness of breath and diffuse wheezing. These findings suggest which of the following events?
- Type I hypersensitivity reaction
 - Arthus reaction
 - FcR-bearing cells binding to host cells coated with IgG
 - IgG binding to extracellular matrix of the respiratory passages
 - IgM-mediated interaction with cell membranes of lymphocytes
28. Which of the following disease is common among individuals with deficient immune system?
- Asthma
 - Cancer
 - Edema
29. The virus that causes acquired immune deficiency syndrome parasitizes
- B-lymphocytes
 - T-lymphocytes
 - CD4⁺ T cell
 - The membranes of lymph nodes



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17. Natural killer cells assess whether other cells are abnormal by detecting types and levels surface-associated
- MHC class I molecules.
 - nonspecific molecules.
 - pathogen-associated molecular patterns.
 - pattern recognition receptors.
 - somatically generated cell surface receptors.
18. Somatically generated receptors found on B and T lymphocytes are
- bound only to MHC I molecules.
 - encoded in the germline to recognize pathogen-associated molecular patterns.
 - first produced after an initial encounter with nonself.
 - identical among individuals.
 - randomly generated during development.
19. During an early part of its development, the binding of a lymphocyte's antigen receptor to a specific epitope may result in the inactivation or death of that cell. Under these circumstances the epitope in question would be described as a(n)
- adjuvant.
 - carrier.
 - hapten.
 - immunogen.
 - tolerogen.
20. Epitope binding before Fc receptor engagement is not required for
- carrier molecules.
 - hapten-carrier conjugates.
 - haptens.
 - IgE.
 - IgG.
21. Which of the following types of cells are notable for their presence at the sites of helminth infections?
- Basophils
 - Eosinophils
 - Lymphocytes
 - Monocytes
 - Neutrophils
22. Which of the following cells are important effector cells in allergic reactions?
- Basophils
 - Dendritic cells
 - Lymphocytes
 - Monocytes
 - Neutrophils



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11. Humoral immunity is mediated by antibodies from ____ and is involved in the elimination of ____ pathogens. Cell mediated immunity is mediated by ____ and is involved in the elimination of ____ pathogens.
- B lymphocytes; Intracellular; T lymphocytes; Extracellular
 - B lymphocytes; Extracellular; T lymphocytes; Intracellular
 - T lymphocytes; Intracellular; B lymphocytes; Extracellular
 - T lymphocytes; Extracellular; B lymphocytes; Intracellular
12. T cells are made in the ____ and complete their differentiation in the ____.
- Spleen; Thyroid
 - Spleen; Thymus
 - Bone marrow; Thyroid
 - Bone marrow; Thymus
 - Bone marrow; Thalamus
13. Which of the following produce large amounts of antibodies (Igs) and differentiate upon stimulation from helper T cell?
- Cluster of differentiation 4 (CD4+)
 - Cluster of differentiation 8 (CD8+)
 - Plasma cells (activated B cells)
14. Regarding mucosa-associated lymphoid tissue (MALT), which of the following is secreted by E cells across the epithelium?
- IgA
 - IgD
 - IgE
 - IgG
 - IgM
15. What surface immunoglobulins are present once an immature B cell becomes a mature (peripheral) B cell?
- IgD
 - IgM
 - IgA
 - IgA & IgM
 - IgM & IgD
16. What are peripheral cells called if they have never come in contact with antigen?
- Mature cell
 - Immature cell
 - Naïve cell
 - Plasma cell
 - Stem cell

University: Damanhour
Faculty: Science
Department: Chemistry
Year: 2015-2016
Term: 2nd



Course Title: Immunology
Course code: Bioc . 308
Time Allowed: 2 Hours
Total Marks: 70
Professor Name: Dr/ Batoul Mohamed Izzularab

Question 1 (30 marks) Choose the correct answer:

1. The ____ immune system uses ____ as well as molecules (e.g. complement components). The ____ immune system uses ____ as well as antigen recognition molecules.
 - a. Adaptive; Phagocytes; Innate; Lymphocytes
 - b. Adaptive; Lymphocytes; Innate; Phagocytes
 - c. Innate; Phagocytes; Adaptive; Lymphocytes
 - d. Innate; Lymphocytes; Adaptive; Phagocytes
2. Which of the following is a messenger that mediates the connection between the innate and adaptive immune systems?
 - a. Complement components
 - b. Vaccines
 - c. T and B lymphocytes
 - d. Cytokines
 - e. Interferons
3. B-cell antigen receptors can interact directly with antigen, whereas T-cell antigen receptors only recognize antigen when it is presented to them on the surface of another cell.
 - a. True
 - b. False
4. Which of the following is NOT true when comparing innate to adaptive immunity?
 - a. Innate responds quickly and adaptive responds slowly
 - b. Innate has few pathogen (non-self) recognition mechanisms and adaptive has many
 - c. Innate has immunologic memory and adaptive does not
 - d. Innate does not show response improvements over time and adaptive does
 - e. Innate response is non-specific and adaptive is very specific
5. Phagocytes ingest particular matter into cells for degradation. Which of the following is NOT considered a phagocyte?
 - a. Macrophage
 - b. Neutrophil
 - c. Eosinophil
 - d. Basophil
 - e. Lymphocyte

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-
6. Which of the following components of the innate immune system involve recognition molecules such as mannan-binding lectin (MBL) for bacteria with mannose on the surface?
- Natural killer (NK) cells
 - Complement system
 - Oxygen dependent and independent killing
 - Interferons
 - Acute phase proteins
7. Which of the following components of the innate immune system involves the release of histamine?
- Neutrophil
 - Eosinophil
 - Macrophage
 - Tissue mast cell
 - Basophile
8. Which of the following components of the adaptive immune system secretes immunoglobulin (Ig)?
- Activated B cell (plasma cell)
 - CD4+ activated T cell
 - CD8+ cytotoxic T cell (CTL)
 - Resting lymphocytes (B cell, CD4+ T cell, CD8+ T cell)
 - B and C
9. Which of the following components of the adaptive immune system causes lysis of virally infected cells and the release of cytokines?
- Activated B cell (plasma cell)
 - CD4+ activated T cell
 - CD8+ cytotoxic T cell (CTL)
 - Resting lymphocytes (B cell, CD4+ T cell, CD8+ T cell)
 - B and C
10. Which of the following is NOT a major feature (characteristic) of the adaptive immune system?
- Specificity
 - Memory
 - Speed

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30. Blood vessels near wound dilate and become more permeable in response to which material released from damaged cells?

- a. Antibodies
- b. Histamine
- c. cytokines

Question 2 (15 marks) write briefly on Inflammation

Question 3 (25 marks) write short note on:

- 1. Pattern recognized receptor
- 2. B cell receptor
- 3. Defense mechanism in respiratory tract (physical & microbicidal action)
- 4. Type IV hypersensitivity

Best wishes



Damanhur University
Faculty of Science
Chemistry Department
Third year for Special Degree (Polymers C343)
Prof. Dr. Ramadan Elsokkary



JUN 2016

Time allowed: 2 hours

Answer the following questions

1. Explain the polymerization of styrene by free radical mechanism in three steps (initiation, propagation, and termination) (18 points)
2. How can you prepare polypropylene by using Ziegler-Natta catalyst? Explain the reaction mechanism step by step to show the transformation of π -complex to δ -complex? (18 points)
3. Give the name and structure of the monomer of the following polymers: (6 points)
 - i) Teflon
 - ii) Nylon 6
 - iii) polystyrene
4. How can you prepare Nylon 6,6? And what is the type of this polymer? (7 points)
5. Draw the structures of the following stereoisomers of polyvinyl chloride (6 points)
 - i) Atactic PVC
 - ii) Isotactic PVC
 - iii) Syndiotactic PVC
6. Complete the following reactions: (15 points)
(Draw all the structures and give the name of final products)
 - i) Cyclohexanone $\xrightarrow{\text{NH}_2\text{OH}}$ $\xrightarrow{\text{H}^+}$
 - ii) Terephthalic acid + ethylene glycol $\longrightarrow$
 - iii) Styrene + BuLi $\xrightarrow{\text{THF}}$ $\xrightarrow{\text{H}^+}$

Good Luck



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Prof. Dr. Ramadan Elsokkary

JUN 2016

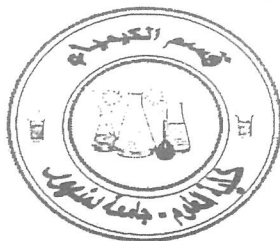
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Good Luck

Course Title: Natural Products
Course code:
Time Allowed: 2 Hours
Points: 60
Professor Name: Wafaa M. Ibrahim



University: Damanhour
Faculty: Science
Department: Chemistry
Year: Third (Chem-BioChem).
Term: Date: 8 /6/2016

Define the following: (10 marks)

Mycotoxin

Triterpens

Pseudoalkaloids

Carotenoids

Citrinin

.What is the functions of anthocyanins? (10 marks)

Write notes on the following: (20 marks)-

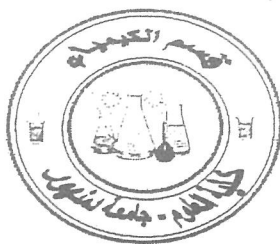
- 1- Aflatoxins .
- 2- Anthracene derivatives in plant.
- 3- Medical application of alkaloids.
- 4- Ephedrin

What is the biological importance of flavonoids? (10 marks)

Describe the protection against mycotoxin.(10 marks)

GOOD LUCK

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Course code:
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